Complete Summary

GUIDELINE TITLE

Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America.

BIBLIOGRAPHIC SOURCE(S)

High KP, Bradley SF, Gravenstein S, Mehr DR, Quagliarello VJ, Richards C, Yoshikawa TT. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. Clin Infect Dis 2009 Jan 15;48(2):149-71. PubMed

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Bentley DW, Bradley S, High K, Schoenbaum S, Taler G, Yoshikawa TT. Practice guidelines for evaluation of fever and infection in long-term care facilities. Clin Infect Dis 2000 Sep;31(3):640-53. [108 references]

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SCOPE

DISEASE/CONDITION(S)

- Infection
- Fever

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Family Practice
Geriatrics
Infectious Diseases
Internal Medicine
Nursing

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To provide a rational approach to the evaluation of a potentially infected resident of a long-term care facility, while acknowledging the limitations in resources and staffing in skilled nursing facilities
- To help primary providers, consultants, and other health care personnel recognize infection, initiate appropriate treatment sooner, and improve outcomes, with associated reductions in inappropriate antibiotic use and cost of care

TARGET POPULATION

Residents of long-term care facilities with possible infection (with or without fever)

INTERVENTIONS AND PRACTICES CONSIDERED

1. Clinical evaluation (vital signs: temperature, blood pressure, heart rate, respiratory rate, hydration status, mental status, oropharynx, skin, chest, heart, abdomen and any indwelling devices)
2. Laboratory tests
    - Complete blood cell count with differential
    - Blood culture
    - Urinalysis and urine culture
3. Pneumonia evaluation
    - Pulse oximetry
    - Chest radiographs
    - Respiratory secretions
4. Respiratory viral infection evaluation
5. Skin and soft tissue infection evaluation (needle aspiration, deep-tissue biopsy, magnetic resonance imaging, bone biopsy, tissue scrapings)
6. Gastrointestinal infection evaluation (stool sample culture)

7. Investigation of a suspected outbreak
8. Investigation of patients with advanced directives

MAJOR OUTCOMES CONSIDERED

- Diagnostic utility of clinical and laboratory evaluations
- Hospital admission rate from long-term care facilities (LTCFs)
- Rate of inappropriate antibiotic treatment
- Incidence of infection spread in LTCFs
- Morbidity and mortality
- Cost/benefit of diagnostic procedures

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

For the 2008 update, the Expert Panel completed the review and analysis of data published since 1999. Computerized literature searches (with the PubMed database) of the English-language literature published from 1999 through 2007 were performed. Search terms included "long-term care," "geriatrics," "infection," "communication," "testing," "outbreaks," "fever", "nursing home infections," "sepsis," "bacteremia," "pneumonia," "urinary tract infection," "pressure ulcers," "gastrointestinal infections," "scabies," "herpes zoster," "clostridium difficile," "candida," "bacterial diarrhea," "giardiasis," "influenza," "conjunctivitis," and "advanced directives."

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Quality of Evidence*

I. Evidence from ≥1 properly randomized, controlled trial
II. Evidence from ≥1 well-designed clinical trial, without randomization; from cohort or case-controlled analytical studies (preferably from >1 center); from multiple time- series; or from dramatic results from uncontrolled experiments
III. Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

* Adapted from Canadian task Force on the Periodic Health

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The Infectious Diseases Society of America (IDSA) Standards and Practice Guidelines Committee (SPGC) convened experts in the evaluation of residents with fever and infection in long-term care facilities (LTCFs).

The Expert Panel met on 4 occasions via teleconference to complete the work of the guidelines. The purpose of the teleconferences was to discuss the questions to be addressed, to make writing assignments, and to discuss recommendations.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of Recommendation*

A. Good evidence to support a recommendation for use
B. Moderate evidence to support a recommendation for use
C. Poor evidence to support a recommendation

* Adapted from Canadian task Force on the Periodic Health

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

All members of the Expert Panel participated in the preparation and review of the draft guidelines. Feedback from external peer reviews was obtained. The

guidelines were reviewed and approved by the Standards and Practice Guidelines Committee (SPGC) and the Board of Directors prior to dissemination.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions of the levels of evidence (**I-III**) and grades of recommendation (**A-C**) are repeated at the end of the Major Recommendations field.

Resources

Most long-term care facilities (LTCFs) have limited diagnostic equipment on site and are staffed by nursing personnel (primarily certified nurse assistants [CNAs]). Specific data are available to make recommendations for personnel, but no data are available to guide minimal requirements for diagnostic equipment.

1. LTCFs should employ sufficient staff to adequately care for all residents **(B-III)**.

Symptoms and Signs of Suspected Infection

Typical symptoms and signs of infection are frequently absent in LTCF residents, and as one ages and becomes more frail, basal body temperature decreases, making it less likely that one will achieve classic definitions of fever. Infection should be suspected in residents with any of the following characteristics:

2. Infection should be suspected in LTCF residents with:
    A. Decline in functional status, defined as new or increasing confusion, incontinence, falling, deteriorating mobility, reduced food intake, or failure to cooperate with staff **(B-II)**.
    B. Fever, defined as: (1) A single oral temperature >100°F (>37.8°C); or (2) repeated oral temperatures >99°F (>37.2°C) or rectal temperatures >99.5°F (>37.5°C); or (3) an increase in temperature of >2°F (>1.1°C) over the baseline temperature **(B-III)**.

Evaluation of the Resident

CNAs are almost always the first to recognize a symptom or sign of infection in LTCF residents, but data suggest that they frequently misinterpret these clinical clues.

3. The initial clinical evaluation of infection should be a 3- tiered approach involving a CNA, the on-site nurse, and an advanced-practice nurse, physician assistant, or physician **(B-III)**.
4. CNAs should measure vital signs (temperature, heart rate, blood pressure, and respiratory rate). Residents who are suspected of having an infection or who have fever, as defined previously, should be reported immediately to the on-site nurse **(B-II)**.

Clinical Evaluation

Few data are available to suggest which of the most helpful clinical evaluations should be performed in LTCF residents with suspected infection. However, on the basis of the most common sites of infection and the tenuous physiologic reserve for most residents of LTCFs, the following recommendations can be made:

5. Initial clinical evaluation should involve assessment of respiratory rate, hydration status, mental status, oropharynx, conjunctiva, skin (including sacral, perineum, and perirectal areas), chest, heart, abdomen, and indwelling devices (if present) **(B-III)**.

Communication

Effective communication of a resident's status is perhaps intuitive, but some guiding principles can be stated.

6. Information should be relayed to the responsible advance practice nurse, physician assistant, or physician for decisions regarding further evaluation **(B-III)**.
7. The full extent of the clinical evaluation should be documented as part of the medical record. If specific diagnostic measures are consciously withheld, the reasons should be recorded **(B-III)**.

Laboratory Tests

A full summary of the evaluations for laboratory tests in specific situations is not possible, because they are too numerous to list. The reader is referred to the recommendations for specific syndromes (i.e., urinary tract infection [UTI], pneumonia, gastrointestinal [GI] infection, and skin and soft-tissue infection [SSTI]). However, several overall guiding principles can be highlighted.

Initial Diagnostic Testing

8. Advance directives for residents should be reviewed prior to any intervention; if not prohibited by such directives, initial diagnostic tests for suspected infection can be performed in the LTCF if resources are available and if studies can be done in a timely manner **(B-III)**.

Blood Cell Count

9. A complete blood cell (CBC) count, including peripheral white blood cell (WBC) and differential cell counts (preferably a manual differential to assess bands and other immature forms), should be performed for all LTCF residents who are suspected of having infection within 12–24 hours of onset of symptoms (or sooner, if the resident is seriously ill), consistent with local standards of practice **(B-II)**.
10. The presence of an elevated WBC count (WBC count, $\geq$14,000 cells/mm^3) or a left shift (percentage of band neutrophils or metamyelocytes, >6%; or total band neutrophil count, $\geq$1500 cells/mm^3) warrants a careful assessment for

bacterial infection in any LTCF resident with suspected infection, with or without fever **(B-II)**.

11. In the absence of fever, leukocytosis and/or left shift, or specific clinical manifestations of a focal infection, additional diagnostic tests may not be indicated, because of the low potential yield **(C-III)**. Nonbacterial infections, however, cannot be excluded.

Urinalysis and Urine Culture

12. Urinalysis and urine cultures should not be performed for asymptomatic residents **(A-I)**.
13. In noncatheterized residents, the diagnostic laboratory evaluation of suspected UTI should be reserved for those with acute onset of UTI-associated symptoms and signs (e.g., fever, dysuria, gross hematuria, new or worsening urinary incontinence, and/or suspected bacteremia) **(A-II)**.
14. In residents with long-term indwelling urethral catheters, evaluation is indicated if there is suspected urosepsis (i.e., fever, shaking chills, hypotension, or delirium), especially in the context of recent catheter obstruction or change **(A-II)**.
15. Appropriately collected urine specimens include a midstream or clean-catch specimen obtained from elderly men who are cooperative and functionally capable; however, it is often necessary to use a freshly applied, clean condom external collection system, with frequent monitoring of the urine bag **(BII)**. Specimen collection from women will often require an in-and-out catheterization **(B-III)**.
16. Residents with long-term indwelling urethral catheters and suspected urosepsis should have catheters changed prior to specimen collection and institution of antibiotic therapy **(A-II)**.
17. The minimum laboratory evaluation for suspected UTI should include urinalysis for determination of leukocyte esterase and nitrite level by use of a dipstick and a microscopic examination for WBCs **(B-II)**. If pyuria (>10 WBCs/high-power field) or a positive leukocyte esterase or nitrite test is present on dipstick, only then should a urine culture (with antimicrobial susceptibility testing) be ordered **(B-III)**.
18. If urosepsis is suspected, urine and paired blood specimens should be obtained, if feasible, for culture and antimicrobial susceptibility testing, and a Gram stain of uncentrifuged urine should be requested **(B-III)**.

Blood Culture

19. In a study of older adult nursing home residents, blood cultures were demonstrated to have a low yield and rarely to influence therapy; thus, they are not recommended for most residents of LTCFs **(B-II)** (note: this may not apply to all types of residents or to all types of LTCFs). Blood cultures may be appropriate for residents in whom bacteremia is highly suspected and if the LTCF has quick access to laboratory facilities, adequate physician coverage to respond to positive culture results, and a capacity to administer parenteral antibiotics.

<u>Pneumonia Evaluation</u>

If pneumonia is clinically suspected and resources are available, the following diagnostic studies should be performed:

20. Pulse oximetry should be performed for residents with respiratory rates of >25 breaths/min, to document hypoxemia (oxygen saturation, <90%) in residents with suspected pneumonia and to guide transfer to an acute care facility pending the resident's or family's wishes **(B-II)**.
21. Chest radiography should be performed if hypoxemia is documented or suspected, to identify the presence of a new infiltrate compatible with acute pneumonia and to exclude other complicating conditions (e.g., multilobe infiltrates, large pleural effusions, congestive heart failure, or mass lesions) **(B-II)**.

Respiratory Viral Infection Evaluation

22. At the onset of a suspected respiratory viral infection outbreak, nasopharyngeal wash or swab samples obtained from the throat and nasopharynx (combined with refrigerated viral transport media in a single tube) should be obtained from several acutely ill residents for transportation to an experienced laboratory for virus isolation and rapid diagnostic testing for influenza A virus and other common viruses **(A-III)**.

Evaluation of SSTI

23. Bacterial cultures should be performed only under select conditions. Surface swab cultures are not indicated for the diagnosis of most bacterial SSTIs **(A-II)**, with the exception of conjunctivitis **(B-III)**. Needle aspiration (only skilled physicians should perform this procedure) or deep-tissue biopsy to obtain samples for Gram stain and culture may be appropriate in special circumstances in which unusual pathogens are suspected, fluctuant areas suggest an abscess is present, or initial antimicrobial treatment has been unsuccessful **(C-III)**.
24. If a pressure ulcer demonstrates poor healing and/or persistent purulent drainage, obtain deep specimens for culture of tissue and bone specimens at the time of surgical debridement or biopsy **(B-II)**. Magnetic resonance imaging (MRI), is the most sensitive imaging modality to detect osteomyelitis, but bone biopsy for histopathologic examination definitively confirms the diagnosis and is most useful in guiding antimicrobial therapy **(A-III)**.
25. For suspected mucocutaneous fungal infection, a scraping can be performed for potassium hydroxide 10% preparation to verify the presence of yeast or dermatophytes **(B-III)**. If mucocutaneous candidiasis is refractory to empirical treatment, culture can be performed for the detection of drug-resistant species **(B-III)**.
26. For suspected herpes simplex or herpes zoster, skin scrapings may be examined for the presence of giant cells (Tzanck preparation) and/or sent for culture, immunofluorescent viral antigen studies, or PCR **(A-III)**.
27. Scabies should be considered in any nursing home resident with a generalized rash that is unexplained. Diagnosis should be attempted by light microscopy demonstration of mites, eggs, or mite feces on mineral oil preparations of several scrapings **(B-III)**. If proper diagnostic equipment is not available and if clinical experience with scabies is limited, consider consultation with a dermatologist to inspect or obtain scrapings from suspected persons **(C-III)**.

Evaluation of GI Infection

28. In the absence of an outbreak of GI illness, residents with symptoms of gastroenteritis consistent with small bowel infection and a stable clinical status should be evaluated before 7 days for volume assessment, but no laboratory evaluation is required unless the resident is severely ill or symptoms persist beyond 7 days. In such cases, presence of Giardia species and other protozoa should be examined in stool specimens **(B-III)**.
29. If the resident exhibits symptoms of colitis (e.g., severe fever, abdominal cramps, and/or diarrhea, with or without blood and/or WBCs in the stool), initial evaluation for *Clostridium (C.) difficile* should be performed, especially if the patient has received antibiotics within the previous 30 days. Submit a single diarrheal stool specimen to the laboratory for a *C. difficile* toxin assay. If diarrhea persists and if the assay result is negative, submit 1 or 2 additional stool specimens for the toxin assay **(A-II)**.
30. In a patient with symptoms of colitis but no history of antibiotic use within the previous 30 days and/or a negative *C. difficile* evaluation result, one should submit a stool sample for culture for isolation of the most frequent invasive enteropathogens (i.e., *Campylobacter jejuni, Salmonella* and *Shigella* species, and *Escherichia coli* O157:H7) **(A-II)**.
31. Local public health authorities should be consulted if rates of gastroenteritis or colitis exceed baseline thresholds in the facility (if these thresholds are known), if $\geq$2 cases occur at the same time in the same unit, or if a reportable pathogen is isolated **(B-III)**.
32. Intra-abdominal infections and abscesses can occur in LTCF residents as a consequence of GI pathology. These complications are relatively uncommon but are associated with substantial morbidity and mortality; evaluation and treatment of possible abscesses should be performed in an acute care setting **(B-III)**.

Suspected Outbreak

A broad description of an outbreak investigation is beyond the scope of these guidelines, but a general guide is provided, including circumstances in which appropriate authorities (e.g., the Centers for Disease Control and Prevention) should be notified. An important aspect of the outbreak investigation is that residents with advanced directives that prohibit testing can and often should be tested if the goal is not for care of that specific patient but reduction in the risk of illness in others.

33. During a possible outbreak of infection, testing of residents, regardless of advanced directive status, may be war ranted for diagnostic and infection-control purposes for the protection of other residents and staff **(B-III)**.

Definitions:

Quality of Evidence

I. Evidence from $\geq$1 properly randomized, controlled trial
II. Evidence from $\geq$1 well-designed clinical trial, without randomization; from cohort or case-controlled analytical studies (preferably from >1 center); from multiple time- series; or from dramatic results from uncontrolled experiments

III. Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

Strength of Recommendation

A. Good evidence to support a recommendation for use
B. Moderate evidence to support a recommendation for use
C. Poor evidence to support a recommendation

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Reduction in need for hospitalization of patients in long-term care facilities (LTCF)
- Reduction in mortality due to infection
- Reduction in inappropriate antibiotic use
- Reduction in cost of care
- Reduction in the risk of infection of other inhabitants of LTCFs

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

It is important to realize that guidelines cannot always account for individual variation among patients. They are not intended to supplant physician judgment with respect to particular patients or special clinical situations. The Infectious Disease Society of America considers adherence to these guidelines to be voluntary, with the ultimate determination regarding their application to be made by the physician in the light of each patient's individual circumstances.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Audit Criteria/Indicators
Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

High KP, Bradley SF, Gravenstein S, Mehr DR, Quagliarello VJ, Richards C, Yoshikawa TT. Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America. Clin Infect Dis 2009 Jan 15;48(2):149-71. PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Sep (revised 2009 Jan 15)

GUIDELINE DEVELOPER(S)

Infectious Diseases Society of America - Medical Specialty Society

SOURCE(S) OF FUNDING

Infectious Diseases Society of America (IDSA)

GUIDELINE COMMITTEE

Infectious Diseases Society of America (IDSA) Practice Guidelines Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the Expert Panel complied with the IDSA policy on conflicts of interest, which requires disclosure of any financial or other interest that might be construed as constituting an actual, potential, or apparent conflict. Members of the Expert Panel were provided the IDSA's conflict of interest disclosure statement and were asked to identify associations with companies developing products that may be affected by promulgation of the guidelines. Information was requested regarding employment, consultancies, stock ownership, honoraria, research funding, expert testimony, and membership on company advisory committees. The Expert Panel made decisions on a case-by-case basis as to whether an individual's role should be limited as a result of a conflict. Potential conflicts are listed in the Acknowledgements section in the original guideline document.

Potential Conflicts of Interest: K.P.H. has received research grants from Cubist Pharmaceuticals, Atlantic Philanthropies, Optimer, Viropharma, John A. Hartford Foundation, and Astellas Pharma; has served on the advisory board of Merck & Co and on the Board of Directors of the American Board of Internal Medicine; and served on the speakers' bureaus of Merck & Co. and Wyeth.; S.G. serves as a consultant for GlaxoSmithKline, The Wellcome Trust, Merck & Co., Wyeth, and Sanofi-Aventis and is contracted through the Quality Partner of Rhode Island as the Clinical Director of Long Term Care Quality Improvement Organization Support Center.; T.T.Y. is editor-in-chief of The Journal of the American Geriatrics Society.; All other authors: no conflicts.

GUIDELINE STATUS

This is the current release of the guideline.

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and infection in long-term care facilities. Clin Infect Dis 2000 Sep;31(3):640-53. [108 references]

GUIDELINE AVAILABILITY

Electronic copies: Available from the Infectious Diseases Society of America (IDSA) Web site.

Print copies: Available from Dr. Kevin P. High, Sections on Infectious Diseases, Hematology/Oncology, and Molecular Medicine, Wake Forest University Health Sciences, 100 Medical Center Blvd., Winston Salem, NC 27157-1042 (khigh@wfubmc.edu).

AVAILABILITY OF COMPANION DOCUMENTS

A PDA version of the original guideline document is available from Infectious Diseases Society of America (IDSA) Web site.

Performance measures are available in the original guideline document.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 1, 2001. The information was verified by the guideline developer as of June 29, 2001. This summary was updated by ECRI Institute on June 11, 2009.

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